Alternatives in Framing and Decision Making

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Abstract: There is a wealth of experimental data showing that the way a problem is framed may have an effect on people’s choices and decisions. Based on a semantic analysis of evaluative expressions like ‘good’, I propose a new explanation of such framing effects. The key idea is that our choices and decisions reveal a counterfactual systematicity: they carry information about the choices and decisions we would have made if the facts had been otherwise. It is these counterfactual alternatives that may diverge between otherwise equivalent versions of the same task, and thus explain the effects of framing.

Introduction

In a now–classic study by Tversky and Kahneman (1981), one group of participants was presented with the following dilemma (p. 453):

Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

– If Program A is adopted, 200 people will be saved.
– If Program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved.

Which of the two programs would you favor?

To a second group of participants, Tversky and Kahneman gave an alternative version of the same problem, in which the descriptions of the programs had been rephrased:

– If Program C is adopted, 400 people will die.
– If Program D is adopted, there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.

Many thanks for discussion and comments to Denis Hilton, David Mandel, Rick Nouwen, Christophe Schmeltzer, Shlomi Sher, and an anonymous reviewer for Mind & Language. This research was supported by a grant from the Netherlands Organisation for Scientific Research (NWO), which is gratefully acknowledged.

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While Program A (‘200 people will be saved’) was chosen 72% of the time, its counterpart Program C (‘400 people will die’) got only 22% of the participants’ votes.

Whereas from a layman’s perspective, this finding may seem unsurprising, it is of considerable academic interest, as it causes a major embarrassment to the classical view on decision making. The trouble is that on the classical view there is no reason why people should decide differently between the two conditions, since the two problems are, or at least would appear to be, in Tversky and Kahneman’s own words, ‘effectively identical’ (ibid.).

In their analysis of the Asian Disease experiment, Tversky and Kahneman distinguish between ‘two phases in the choice process: an initial phase in which acts, outcomes, and contingencies are framed, and a subsequent phase of evaluation’ (p. 454). Their treatment of these phases is markedly uneven: while they lavish attention on the second phase, the first one is dealt with perfunctorily, as if framing was only a preliminary to evaluation.

In this article, I will suggest that Tversky and Kahneman’s analysis gets off on the wrong foot. Contrary to what these authors suppose (without argument), there are rather good reasons for doubting that the difference between their two problems is just a matter of framing, and furthermore, the ‘framing phase’ is much more important than Tversky and Kahneman are prepared to give it credit for. In fact, I believe that for a proper understanding of Tversky and Kahneman’s findings, the evaluation phase is of secondary interest, at best.

Unfortunately, Tversky and Kahneman’s experiment is marred by a number of flaws that stand in the way of a precise analysis (cf. Mandel, 2001). The Asian Disease scenario is an unlikely mix of conjecture and precision (‘exact scientific estimate’), it is unclear how number terms are to be interpreted (‘200 people’ might be construed as ‘about 200 people’ or ‘at least 200 people’), and most importantly, participants are confronted with a choice that is as improbable as it is complex.

Still, in the meantime Tversky and Kahneman’s main finding has been vindicated by a host of experimental studies, many of which are cleaner and simpler. For instance, Levin (1987) asked participants to evaluate the hypothetical purchase of ground beef that was described as ‘75% lean’ for one group and ‘25% fat’ for another. Despite the fact that these descriptions are in a sense equivalent (75% lean ground beef is 25% fat, and vice versa), Levin found that the first group produced higher ratings on several scales, including high/low quality and good/bad taste; these effects persist, though at attenuated levels, even after the ground beef has been tasted (Levin and Gaeth, 1988). Similarly, when medical treatments were alternatively described in terms of survival and mortality rates (McNeill et al., 1982; Levin et al., 1988) or when R&D teams were alternatively presented in terms of their success and failure rates (Duchon et al., 1989), positive descriptions prompted higher rates of positive responses (see Levin et al., 1998 for a survey of the first wave of framing experiments precipitated by Tversky and Kahneman’s study).
How is it possible for equivalent descriptions to give rise to inconsistent evaluations? In my view, this is the essential framing problem, and it is this problem that I will be addressing in the following. The approach I will take is a semantic one. This is not to imply that framing is all about interpretation. I do believe interpretation is an important part of the puzzle, and much more important than Tversky and Kahneman seem to have thought. But semantics cannot explain framing effects all by itself. After all, semantics is about how utterances are interpreted; it is not about the perceived quality of medical treatments or ground beef. Still, issues of evaluation and issues of interpretation are closely related, and therefore studying the latter may help to solve the former. The connection between the two sets of issues is rather straightforward. Consider one of the participants in Levin’s experiment who gave a high rating to 75% lean beef. Such a participant would probably be prepared to say that:

(1) This ground beef must be quite good, because it’s 75% lean.

On the other hand, a participant who gave a low rating to 25% fat beef would rather say:

(2) This ground beef can’t be very good, because it’s 25% fat.

The contrast between (1) and (2) is a semantic problem: How is it possible that two contradictory statements can be justified by referring to the same state of affairs? The solution to this problem requires a semantic analysis of expressions like ‘good’ and ‘because’, and since it is quite likely that the meanings of these expressions reflect our practices of evaluation and justification, it is not unreasonable to expect that semantic analysis might shed some light on the framing problem we began with.

Hence, the procedure adopted in this article is as follows. To begin with, I introduce a very simple kind of framing puzzle, which I will proceed to recast in semantic terms (Section 1). A rather large portion of the article will be spent developing a solution to the semantic problem (Sections 2–4). In a nutshell, the idea underlying the proposed solution is that framing puzzles involve two distinct scales, which are preferably aligned in the sense that any increase on one scale entails an increase on the other, as a consequence of which it would be unreasonable to give the same response in both versions of the task. Once the semantic analysis is

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1 Caveat: One of the problems pervading the framing literature is that it is often unclear what it means for two descriptions to be ‘equivalent’. As we will see (Sections 1–3), linguistic expressions may be equivalent (or fail to be equivalent) in many different respects, and it is critically important to be precise on this point. In the following, I will say that two sentences are ‘descriptively equivalent’ if they have the same truth conditions; that is to say, whenever one is true, the other is true, as well.

2 More accurately: my starting point is the interpretation of evaluative expressions like ‘good’, which is partly semantic and partly pragmatic. I will use ‘semantic’ as a short-hand for ‘semantic and/or pragmatic’.
in place, I will try to show how it transfers to the original framing problem. It is only at the end of the article that I will return to attested experimental findings involving Asian diseases, ground beef, and so forth (Section 5).

1. Puzzle Section

I have suggested that we can ‘translate’ framing problems into semantic puzzles of a certain kind, exemplified by the contrast between (1) and (2). However, I prefer to have a simpler problem to work with, for two reasons. First, since I will be talking about sentences a lot, it will be convenient to have sentences that are as short as possible. Secondly, I would like to begin with a version of the framing problem that is as simple as possible (I will explain later why I think it is simpler than others). Whence the following, semi-fictitious example. Prima facie, it would seem that in the given context, (3a) and (3b) are descriptively equivalent:

(3) The crashed airplane was carrying 600 passengers.
   a. 200 people survived.
   b. 400 people died.

Imagine we asked participants to rate this outcome on a 7-point scale, where 1 is ‘very bad’ and 7 is ‘very good’. In view of the extant data, it is a moral certainty that (3a) would prompt significantly higher ratings than (3b). The question then is how this discrepancy might be explained. This is a typical framing problem.

The corresponding semantic problem goes as follows. If (3a) and (3b) are descriptively equivalent, then (4a) and (4b) should be so, too:

(4) a. It’s good that [200 people survived].
   b. It’s good that [400 people died].

But these sentences seem to contradict each other. To add to the mystery, not every old pair of (seemingly) equivalent descriptions will result in a contradiction.

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3 ‘Semi-fictitious’ because it is obviously very similar to several scenarios that have been used in the experimental literature. Note that (3a) and (3b) are past-tense versions of Tversky and Kahneman’s Programs A and C.
4 Here and henceforth I use square brackets to indicate the basic grammatical structure of a sentence. Thus, (4a) consists of two parts: the bracketed sentence and the predicative phrase ‘It’s good that . . .’.
5 Several readers of earlier versions of this paper have suggested to me that the embedded sentences in (4a) and (4b) refer to distinct facts; on their account, the fact that 200 people survived is distinct from the fact that 400 people died. I don’t have any principled objections against this line of thought, but would like to note that its implementation may be less straightforward than it seems. First, we will need a theory of facts that allows us to distinguish between (3a) and (3b) even though, in the context given, these sentences entail each other. Furthermore, while facts may help to explain why (4a) and (4b) are not equivalent, it is by no means obvious how they might contribute to a solution of the other problems we will be dealing with.
For instance, though (5a) and (5b) seem to be equivalent in pretty much the same way as (3a) and (3b) are, (6a) and (6b) do not contradict each other. On the contrary, they appear to be synonymous.

(5)  
  a. More than 200 people survived.  
  b. Fewer than 400 people died.  

(6)  
  a. It’s good that [more than 200 people survived].  
  b. It’s good that [fewer than 400 people died].

The main puzzle I will be concerned with in the following consists of two parts: it is to explain, on the one hand, why (4a) and (4b) appear to contradict each other, whereas, on the other hand, (6a) and (6b) are mutually compatible, and perhaps even synonymous. Once this problem is solved, we will see that the solution carries over quite smoothly to the original framing problem.

In the following I will argue that, contrary to first appearances, the bracketed sentences in (4) aren’t fully equivalent: their alternatives are different, and evaluative expressions like ‘good’ are sensitive to this difference. In this connection, ‘alternative’ is a term of art, which is in common currency in semantics. Alternatives are widely held to be implicated in a range of interpretative phenomena, which I will discuss at some length in order to convey an impression of what alternatives are and how they affect utterance interpretation. At the end of this part of the story, I will explain how alternatives influence the interpretation of evaluative expressions like ‘good’, and how the difference between (4a) and (4b) can be accounted for.

Before we get started, though, I should emphasise that most of the following ideas do not originate with me. As I just said, alternatives are firmly entrenched in current theories of interpretation, and therefore the bulk of the analysis I’m about to propose is motivated on independent grounds. The main innovation I have to offer is what I call ‘alignment’; most of the rest is common semantic lore.

2. Alternatives

The interpretation of an utterance is determined not only by what the speaker says, but also what he could have said:

(7)  
  Q: With whom did Fred dance?  
  A: Fred danced with Wilma.  
  Alternatives: Fred danced with Betty.  
    Fred danced with Wilma.  
    Fred danced with Barney.

In this example, Q presents A with a range of alternatives of the form ‘Fred danced with x’: Q’s question can be interpreted as a request to specify the
appropriate value(s) of $x$, and $A$ obliges by selecting one alternative.\textsuperscript{6} Furthermore, the intonation contour of $A$’s answer indicates, and thus confirms, that the relevant alternatives are of the form ‘Fred danced with $x$’.\textsuperscript{7} It does so simply by accenting that part of the sentence which varies between alternatives. It is for this reason that ‘Fred danced with Wilma’ would have been an infelicitous answer: its alternatives fail to align with the alternatives presented by the question. With this intonation, the sentence requires a different kind of context, like the following, for instance:

(8) Q: Who danced with Wilma?
   A: Fred danced with Wilma.
   Alternatives: Betty danced with Wilma.
   Fred danced with Wilma.
   Barney danced with Wilma.

While in exchanges like (7) and (8), alternatives help to coordinate contributions by different speakers, in the following example their role is a different one:

(9) Wilma danced with some of the boys.
   Alternatives: Wilma danced with some of the boys.
   Wilma danced with most of the boys.
   Wilma danced with all the boys.

Someone who utters (9) could have made a stronger statement, like ‘Wilma danced with most of the boys’ or ‘Wilma danced with all the boys’. Why didn’t he do so? Presumably, because he doesn’t believe that these alternatives are true. That is, the hearer is entitled to infer that, for all the speaker knows, Wilma didn’t dance with a majority of the boys, and \textit{a fortiori} she didn’t dance with all the boys. Thus, alternatives figure prominently in the derivation of so-called ‘quantity implicatures’ (Grice, 1975; Horn, 2009; Geurts, 2010).

Yet another way in which alternatives can affect the process of interpretation is that there is a family of expressions that depend on them for discharging their semantic duties. This is an important juncture in my narrative, because I will be arguing later that ‘good’ and other evaluative expressions belong to this family, as well, but in order to introduce the basic idea I will concentrate my attention on stock-in-trade examples, many of which involve unassuming little words like ‘too’ (Heim, 1992; Geurts and van der Sandt, 2004; Beaver and Zeevat, 2007):

(10) [Betty danced with Fred], too.
    Alternatives: Betty danced with Fred.
    Wilma danced with Fred.
    Barney danced with Fred.

\textsuperscript{6} In most of the examples to be discussed in the following, sets of alternatives will be conveniently small and more crisply defined than they would be in most real-life situations.

\textsuperscript{7} This is known as ‘question/answer congruence’. See, e.g., Halliday, 1967; Schwarzschild, 1999; Reich, 2009.
Here, ‘too’ conveys that, apart from Betty, there was somebody else who danced with Fred. If we let the focus shift from ‘Betty’ to ‘Fred’, this inference changes accordingly:

(11) [Betty danced with Fred], too.

*Alternatives:* Betty danced with Wilma.
Betty danced with Fred.
Betty danced with Barney.

This sentence implies, rather, that Fred wasn’t the only one Betty danced with. These observations are accounted for by hypothesising the following meaning for ‘too’:

(12) ‘φ too’ means that φ and that some ψ ∈ Alt(φ), φ ≠ ψ, is true as well (where ‘Alt(φ)’ refers to φ’s alternatives).

On this analysis, (11) means that (i) Betty danced with Fred and (ii) amongst the alternatives associated with ‘Betty danced with Fred’, there is at least one further proposition that is true, as well. Which is to say, given the set of alternatives listed for (11), that Betty danced with Fred and either Wilma or Barney.

To be sure, this analysis simplifies things somewhat (see the references cited above for more sophisticated treatments), but that doesn’t matter. The important thing is just that, in order to calculate the meaning of the word ‘too’, in a given context, the hearer has to take into account the alternatives associated with the sentence this word is attached to.

3. Scales and Alignment

Another word whose interpretation involves alternatives is ‘even’:

(13) Barney even drank a martini.

*Alternatives:* Barney drank a martini.
Barney drank a glass of beer.
Barney drank a glass of lemonade.

Like ‘too’, ‘even’ depends on alternatives for conveying its part of the speaker’s message, though the details are considerably less straightforward. Here is a first stab at defining the meaning of ‘even’:

(14) ‘Even φ’ means that φ is true and that φ’s prior probability is low, relative to the alternatives in Alt(φ).

This formulation is deliberately vague. We could have said that φ’s prior probability is lower than that of any other alternative in Alt(φ), but that might have been too strict. Or, we could have said that φ’s prior probability is lower than that of some other alternatives in Alt(φ), but that would surely have been too lax. The truth
probably lies somewhere in the middle, and it may well be that, in this point, the meaning of ‘even’ is inherently vague. However, let’s shelve this issue and focus on another element in the semantics of ‘even’, which is that it presupposes that the members of $\text{Alt}(\phi)$ are ordered. Such orderings, or ‘scales’, as they are generally called, are often associated with sets of alternatives, though the underlying measure isn’t always probabilistic. For example, if I say,

(15) Betty is at least a lieutenant,

the relevant scale is an institutional rank ordering (lieutenant, captain, major, lieutenant-colonel, etc.); the expression ‘at least’ is used to convey that either ‘Betty is a lieutenant’ or a higher-ranking alternative is true (Geurts and Nouwen, 2007). This message may be surprising but need not convey that it was less likely that Betty should have this rank rather than another.

To return to ‘even’, let us now consider the following example:

(16) Fred even drank five beers.

$\text{Alternatives:}$ Fred drank $n$ beers. ($0 \leq n$)

Numerals and kindred expressions like ‘more than half’, ‘fewer than six’, ‘55%’, and so on, induce quantitative scales: sets of alternatives ordered in terms of quantity. I will say that $\phi$ is ‘stronger’ than $\psi$ (or ‘$\phi > \psi$’ for short) if $\phi$ outranks $\psi$ on a given quantitative scale; if it is the other way round, $\phi$ is ‘weaker’ than $\psi$. What is interesting about the example in (16) (and crucial to our main topic) is that, normally speaking, we would be entitled to infer from this statement that, according to the speaker, prior probability and strength are correlated. That is, supposing that (16) is true and the use of ‘even’ is justified, if Fred had drunk more than five beers, the use of ‘even’ would have been even more justified; and conversely, if Fred had drunk fewer than five beers, the use of ‘even’ would have been less justified. These inferences come so naturally that it is easy to overlook that they don’t follow from the definition in (14). If we want to incorporate them in our analysis, we will have to adopt something like the following assumption. Let’s use $\psi \gg \psi'$ to mean that $\psi$ is more improbable than $\psi'$ (which is to say that $\psi'$ is more probable than $\psi$, but we will presently see that there are reasons for preferring the more prolix expression). Then the inferences we want to capture are obtained by making the following assumption:8

Alignment

For any $\psi$, $\psi' \in \text{Alt}(\phi)$: if $\psi > \psi'$, then $\psi \gg \psi'$.

8 This formulation of Alignment is quite strong and quite a bit stronger than is needed for our present purposes. The reason why I use it nonetheless is that it is simpler than a less idealised version. See Geurts, 2009 for a considerably weaker definition that does the job equally well. Incidentally, in that paper I spoke of ‘Co-optation’ in lieu of ‘Alignment’; the intended meaning was the same.
To illustrate: since $(17a), (17b) \in \text{Alt}(16)$, and $(17b) > (17a)$, Alignment entails that $(17b) \gg (17a)$, or in prose: the prior probability of $(17a)$ is higher than that of $(17b)$.

(17)  

a. Fred drank five beers.  

b. Fred drank six beers.

By ‘Alignment’ I mean the following. ‘Even’ combines with a sentence $\phi$ and presupposes that $\text{Alt}(\phi)$ can be ordered in terms of improbability. Now, if $\text{Alt}(\phi)$ is also ordered in terms of quantity, Alignment says that this ordering and the improbability ordering required by ‘even’ are aligned: ‘more’ on the quantity scale entails ‘more’ on the improbability scale. As a result, (16) conveys information not only about the relative improbability of Fred’s drinking five beers, but also about the relative improbability of his drinking more or less.

The Alignment assumption is optional; it is not part and parcel of the lexical meaning of ‘even’, or any other word, for that matter. Rather, it is a default assumption licensed by world knowledge: unless there is evidence to the contrary, it is a pretty good bet that, if it is unlikely that someone drank $n$ beers, it is less likely that she drank more than $n$. But it is not an immutable law. For example, suppose that Fred was strangely obsessed with the number five, as a consequence of which he would do practically anything to avoid drinking five beers. In such a scenario, (16) would still be assertable, but Alignment wouldn’t hold.

An important fact about scales is that the same domain may be ordered by more than one scale. For example, if I say (18), alternatives are of the form ‘More than $n$ people cheered’:

(18) More than six people cheered.

These alternatives are ordered as follows:

(19) More than $n+1$ people cheered $>$ More than $n$ people cheered.

Hence, alternatives become stronger as the values of $n$ increase. The opposite holds if I say:

(20) Fewer than six people cheered.

The members of $\text{Alt}(20)$ are of the form ‘Fewer than $n$ people cheered’, and they are ordered as follows:

(21) Fewer than $n$ people cheered $>$ Fewer than $n+1$ people cheered.

In this case, alternatives become weaker as the values of $n$ increase (Horn, 1989; Geurts, 2010). Similarly, alternatives to probability statements may be ordered in two ways (cf. Teigen and Brun, 1999):

(22)  

a. It’s certain that Fred is drunk $>$ It’s likely that Fred is drunk.  

b. It’s impossible that Fred is drunk $>$ It’s unlikely that Fred is drunk.
While in (22a) the stronger statement is the one expressing the higher probability, in (22b) the stronger statement expresses the lower probability.

These observations are crucial to my analysis of framing, as we will presently see, but they are also relevant to the formulation of the Alignment assumption. To explain, let’s have a last look at (16), which I repeat here for ease of reference:

(23) Fred even drank five beers.

According to the semantic rule for ‘even’ given in (14), this sentence means that Fred had five beers and that it was relatively unlikely that Fred should drink five beers. Hence, the relevant probability scale is the negative one, in which strength is inversely correlated with probability. This is what motivated my formulation of Alignment: greater strength according to the quantitative scale implies higher improbability, rather than lower probability. Of course, the facts are the same either way, but still the difference matters, because the first description brings out an aspect of Alignment that the second fails to capture, namely that it expresses a positive connection between scales: a higher value on one scale implies a higher value on the other.

4. What is ‘Good’?

In this section, I will argue that in three respects the typical use of ‘good’ is analogous to that of ‘even’: it is (i) constrained by alternatives that (ii) line up in a scale which (iii) will align with a quantitative scale if one is available.9 The following examples demonstrate that the semantic contribution of ‘good’ is constrained by alternatives:

(24) a. It’s good that [Fred kicked Barney].
   b. It’s good that [Fred kicked Barney].
   c. It’s good that [Fred kicked Barney].

Suppose that Betty didn’t like it at all that Fred kicked Barney, and would have very much preferred it if he had bought him a beer or patted him on the back. Then Betty wouldn’t agree with (24b). But she might still agree with (24a) or (24c). For instance, since the relevant alternatives in the latter case are of the form ‘Fred kicked x’, sentence (24c) as a whole means something like: ‘It’s good that Fred kicked Barney rather than someone else’—which Betty can consistently agree with even if she rejects (24b).

These observations suggest that the core meaning of ‘good’ is something like the following:

(25) ‘It’s good that φ’ means that φ ranks sufficiently highly on the relevant qualitative scale which orders Alt(φ).

9 The first two claims are uncontroversial (see, e.g., Kennedy and McNally, 2005). The core of my proposal is (iii).
As in the case of ‘even’, this is vague, but that was to be expected, since ‘good’ is a vague word. A more serious shortcoming of this definition is that it refers to a ‘relevant qualitative scale’ without explaining what that is supposed to be, but fortunately this is an issue we can afford to sidestep, since it has no bearing on the interaction between qualitative and quantitative scales, which is the fulcrum of my analysis.

As in the case of ‘even’, I would like to propose that the expression ‘good’, too, may cause the hearer to adopt the Alignment assumption, with one rather obvious difference: instead of interpreting ‘≫’ in terms of improbability, it is now interpreted in terms of ‘goodness’, i.e. whatever quality is expressed by ‘good’ on a given occasion; so we now read ‘φ ≫ ψ’ as ‘φ is better than ψ’. Hence, as applied to the predicate ‘good’, Alignment says, in slogan form: ‘More is better, less is worse.’ Thus formulated, Alignment explains how (26) comes to imply that it would have been even better if more than 200 of the passengers had survived the crash, and worse if fewer than 200 had been so lucky:

(26) It’s good that [200 people survived].
Alternatives: n people survived.

What is the rationale behind Alignment? It has often been remarked that our species has a penchant for establishing connections. If a kangaroo escapes from the local zoo and a few days later another kangaroo does the same, we will immediately wonder whether there might be a connection. Similarly, if a speaker places two events side by side, like this:

(27) Harry fell. Keith pushed him,

hearers will find it hard not to establish a connection. And so on. Alignment is plausibly seen as resulting from the same drive towards coherence. If a speaker associates two orderings with the same set of objects, it is only natural to suppose that the orderings might be somehow related, especially since one of them (the qualitative one) is greatly underdetermined by literal meaning. This explains why a connection is made, not how it is made. The answer to that question, I would like to suggest, is that Alignment is rooted in world knowledge. Based on regular exposure to quantitative and qualitative scales, we arrive at a notion of how quantity and quality tend to be connected, if they are connected, and that is what underlies Alignment (see Geurts, 2009 for further discussion).

What I have provided so far is by no means a full-fledged analysis of ‘good’, but what we have now is enough for dealing with the air crash puzzle we set out to

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10 As in the case of ‘even’, this is too strong, but a weaker notion of Alignment will do just as well. Cf. note 8.
solve. Recall that our main objective was to explain why (26) and (28) seem to 
contradict each other (in a context in which there were 600 passengers altogether):

(28) It’s good that [400 people died].

 Alternatives: n people died.

Here is the solution I propose. Assuming the Alignment assumption holds in both 
cases, (26) and (28) imply (29a) and (29b), respectively:

(29) For any m and n such that m > n:
   a. m people survived ≫ n people survived.
   b. m people died ≫ n people died.

These inferences obviously contradict each other, and therefore a speaker who 
asserts (26) cannot reasonably commit himself to (28) as well, and vice versa. That is, 
even if their descriptions of the actual facts are equivalent (‘200 people 
survived/400 people died, and that’s good’), (26) and (28) also license inferences 
about counterfactual states of affairs, i.e. about what might have been the case, and 
these turn out to be inconsistent.

Thus one half of our semantic puzzle is solved. The remaining half is to explain 
how, unlike (26) and (28), the following pair of sentences manage to be compatible:

(30) It’s good that [more than 200 people survived].

 Alternatives: More than n people survived.

(31) It’s good that [fewer than 400 people died].

 Alternatives: Fewer than n people died.

The key difference with the previous case lies in the alternatives associated with 
the bracketed sentence contained in (31): as noted in the last section, instances of 
‘Fewer than n people died’ become weaker as the value of n goes up: if fewer than 
n people died, then it is also true that fewer than n+1 people died, rather than the 
other way round. In this sense, the quantitative scale on Alt(31) is reversed with 
respect to the scales associated with the other sentences. It is for this reason that, in 
this case, the inferences generated by the Alignment assumption are consistent:

(32) For any m and n such that m > n:
   a. More than m people survived ≫ More than n people survived.
   b. Fewer than n people died ≫ Fewer than m people died.

These inferences are consistent, and therefore (30) and (31) can be true together. 
What’s more, since (32a) and (32b) are equivalent, we have an explanation for the 
intuition that (30) and (31) are fully synonymous.

To sum up: By uttering a sentence, a speaker evokes a set of alternatives, which 
may be ordered, and in the case of evaluative statements the orderings are in 
qualitative terms. If an evaluative statement evokes a quantitative scale, as well,
the Alignment assumption applies by default, thus generating further inferences about the speaker’s beliefs, though these beliefs are not about the facts as they are, but rather about what might have been the case. If I say, ‘It’s good that 200 people survived’, I offer an assessment of the fact that 200 people survived, and this is the same as when I say, ‘It’s good that 400 people died.’ However, I also convey information about how I would have assessed the situation if the number of survivors had been greater or smaller. This information is different for the two sentences, and the difference is accounted for by the Alignment assumption.

5. Back to Framing

Having dealt with the semantic version of the air crash problem, we now return to the framing version. The scenario is an experiment in which participants are asked to rate the outcome of a hypothetical air crash on a 7-point scale, where 1 is ‘very bad’ and 7 is ‘very good’. The problem is to explain how it is possible that, in this context, (33a) should receive higher ratings than (33b).

(33) The crashed airplane was carrying 600 passengers.
   a. 200 people survived.
   b. 400 people died.

Suppose one of our participants was Betty. She was assigned to the positive condition, and therefore was presented with (33a) rather than (33b). Betty rated the outcome of the accident with a 5, which is clearly on the positive side. Now the key observation is basically the same as in the semantic version of the problem; it is that Betty’s actual choice has consequences for the choices she would have made had the number of survivors been greater or smaller than 200. In the former case, her rating might have been higher than 5 but surely not lower; in the latter case it would have been the other way round. Hence, by the same reasoning that we applied to the semantic version of the puzzle, if Betty had been assigned to the negative condition, it would have been entirely reasonable if she had rated that event lower.

One way of fleshing out this analysis a bit further is by highlighting the communicative aspect of Betty’s behaviour. It can hardly be denied that Betty’s choice is, inter alia, an answer to a question posed by the experimenter (cf. Hilton, 1995), and in this respect essentially equivalent to a statement like, ‘I rate this outcome with a 5’, which would be amenable to the semantic analysis of the last section. It might be argued, therefore, that the framing problem reduces to the semantic problem we’ve already dealt with.

However, although I wouldn’t say this argument is wrong, I don’t believe it gets to the heart of the matter, either. In my view, the key idea underlying the proposed analysis is that, whether or not they are communicated, the decisions we make have counterfactual consequences: our actual decisions carry implications for
decisions we could have made but didn’t. That this is so may be obscured by the
fact that the cases we’ve been dealing with are rather complex, so let me a give
a simpler example. Suppose Barney has won a prize in a television quiz, and that
he can choose between city trips to Amsterdam, Berlin, or Copenhagen. Suppose,
furthermore, that he opts for Berlin. This decision, too, has consequences for the
decisions he would have made if the situation had been different. For example, if
Amsterdam had not been an option, and Barney’s choice had been restricted to
Berlin versus Copenhagen, he again should have chosen Berlin, given that he chose
Berlin in the first case.11 Though in this case, too, the protagonist will express
his decision by linguistic means, it is clear that this is not the reason why it has
counterfactual consequences.

The decisions we are dealing with in this article are more complex than in the
quiz scenario, and that is mainly because they involve scales. However, although
framing experiments have always employed linguistic means for evoking scales, the
scales themselves aren’t linguistic entities: they are alternative runs of events which
are ordered in terms of logical strength, probability, desirability, etc. Scales are
critically involved in the interpretation of linguistic utterances, and this is how they
enter into framing studies, but they can be invoked by non-linguistic means, too.

For example, a silent film of an air crash that focuses on the survivors obviously
accentuates the positive, and therefore will tend to prime positive scales.

When I introduced the air crash scenario, I said it is the simplest kind of framing
problem I know of. What prompted my claim is that, in this scenario, there is a
very close correspondence between the semantic problem and the framing problem.
Just as a speaker who utters a sentence like, ‘It’s good that 200 people survived’,
attributes the property of being good to an event that is described in a certain
way, participants in the corresponding framing experiment evaluate the same event
under the same description. Small wonder, therefore, that it was so easy to move
from one problem to the other.

Things aren’t always as simple as this. Recall Levin’s (1987) experiment, in which
participants had to evaluate ground beef which was described as either ‘75% lean’ or
‘25% fat’, and the first description yielded higher ratings on several scales, including
high/low quality and good/bad taste. In Levin’s experiment, the participants’ task
was not to evaluate the fact that the ground beef was 75% lean or 25% fat; rather,
they had to evaluate the meat itself, while taking into account the fact that it was 75% lean or 25% fat. Hence, their job was more complex than in the air crash experiment.

While I don’t have a fully developed analysis of Levin’s findings to offer, I believe
that the outlines of its explanation are reasonably clear. To begin with, I would like
to propose (34) as a semantic ‘model’ for thinking about the ground beef puzzle:

(34) This ground beef must be good, because it is 75% lean.

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11 This principle is not without exceptions: the contrast with Amsterdam may have highlighted
certain attractive features of, and thus enhanced the preference for, Berlin. See, e.g., Huber et al., 1982 and Tversky and Shafir, 1992 for experimental evidence.

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Someone who accepts (34) has a positive opinion vis-à-vis the ground beef, which is based on the fact that it is 75% lean. It seems to me that this is a fair description of those participants in Levin’s experiment who were assigned to the ‘75% lean’ condition. Now the first thing to note about (34) is that it contrasts with (35) in a way that is reminiscent of our air crash example:

(35) This ground beef must be good, because it is 25% fat.

(34) and (35) appear to be inconsistent for much the same reason as (26) and (28) are: someone who stated one of these sentences could not go on stating the other without contradicting himself. The reason for this seems to be the same as in the air crash scenario: it is that the interpretation of ‘good’ recruits the quantitative scale evoked by the expression ‘75% lean/25% fat’. However, there is an important difference, as well: whereas in (26) and (28), the predicate ‘good’ is directly applied to a state of affairs that has the quantitative scale associated with it, in (34) and (35) the predicate is applied to the ground beef, and the same state of affairs is used to justify the predication. Hence, in these cases, the mechanism underlying alignment is different: alignment is mediated by the justification relation expressed by ‘because’.

One natural corollary of this analysis is that the strength of the framing effect will vary with the strength of the justification relation. If leanness is considered to be an important factor in assessing the meat’s quality, people will be favourably inclined towards the reasoning in (34). If it is less important, e.g. because independent information about the ground beef is provided, the justification proposed by (34) may become less compelling, and the framing effect weakened. This would explain Levin and Gaeth’s (1988) finding that framing effects are attenuated when participants have tasted the ground beef before rating it.

I would like to close this section with some tentative remarks about the archetype of all framing experiments: Tversky and Kahneman’s (1981) Asian Disease study. Recall that, in this experiment, participants were invited to imagine the outbreak of ‘an unusual Asian disease’, which was expected to kill 600 people. In one condition, they then had to choose between Programs A and B:

- If Program A is adopted, 200 people will be saved.
- If Program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved.

In the other condition, the choice was between Programs C and D:

- If Program C is adopted, 400 people will die.
- If Program D is adopted, there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.

Tversky and Kahneman found that, whereas Program A was preferred 72% of the time, its (descriptively equivalent) counterpart Program C was chosen only 22% of the time.
Since their experiment was about choice, Tversky and Kahneman focus their analysis, plausibly enough, on this aspect of the experimental task. However, there are good reasons for doubting that the problem presented by Tversky and Kahneman’s data is essentially about choice. To see why this assumption is a dubious one, we need only ask ourselves what would have happened if, instead of having to choose between programs, participants had been asked to rate Programs A and C. What would have happened? In view of the many analogous studies that have been reported in the literature, it is a sure bet that Program A would have garnered significantly better rates than Program C, and it so happens that we have a ready-made explanation for that contrast, since it is just a minor variation on our air crash puzzle. But regardless whether or not this explanation is correct, the point is that Program A is likely to be found more attractive than Program C.

It follows from these observations that if the alternative programs, i.e. B and D, had been the same for all participants, Tversky and Kahneman should have obtained the same overall pattern of results, though the exact rates might have been different, depending on whether Programs B and D are equally attractive or not. Therefore, choice may not have been a key variable in Tversky and Kahneman’s study; contrary to what these authors assume, it is quite possible that their experiment was targeted primarily at framing rather than choice.

Concluding Remarks

There is a widespread rumour, especially in the popular psychology literature, that framing studies show (once again) that people are irrational (e.g., Sutherland, 1992; Samuels and Stich, 2004; Marcus, 2008). However, though this assessment used to enjoy some support amongst the authors of these studies, there is a growing awareness, in the framing community at least (if not perhaps outside), that the irrationalist response is mistaken.

The irrationalist response is based on a simple fallacy: If two descriptions are descriptively equivalent, i.e. if they have the same truth conditions, then they must be equivalent tout court. In the philosophy of language and adjacent disciplines, the descriptivist fallacy has long been recognised for what it is, and in the framing literature, too, it is acknowledged increasingly often that the information conveyed by a sentence goes beyond its descriptive content. For example, Sanford et al. (2002) argue that quantity statements induce a ‘perspective’ that affects subsequent processing; Teigen and Brun (1999) show that probability expressions have a (positive or negative) ‘directionality’ that influences the hearer’s response (cf. Hilton, 2011 on ‘polarity’); McKenzie and Nelson (2003) present evidence that the speaker’s choice between descriptively equivalent frames may betray a ‘reference point’; and so on.

All these scholars agree that the information carried by a sentence is not exhausted by its descriptive content. Hence, there seems to be a consensus that we need a notion of information that is essentially richer than the classical one. Indeed, I believe
that the consensus runs deeper, that despite obvious differences in terminology and emphasis, the ideas underlying these various approaches are closely related, and that the connections can be brought out within the general framework outlined in the foregoing. However, an in-depth survey of this common ground would go beyond the scope of this article.

Even if a superficial glance suggests that two versions of the same problem are ‘effectively identical’, to quote Tversky and Kahneman’s phrase again, more careful scrutiny will often reveal that they are not and that the differences matter a great deal. Our choices and decisions reveal a counterfactual systematicity: they carry information about the choices and decisions we would have made if the facts had been otherwise. A better understanding of this systematicity will take us a long way to explaining and justifying the effects of framing.

References


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